

CLAIMS

What is claimed is:

[1] A ceramic composite characterized in being composed of a phase having carbon of 3 μm or less average crystal-grain size as the principal component, and a ceramic phase (with the proviso that carbon is excluded).

[2] A ceramic composite characterized in being composed of a phase having carbon of 30 nm or less average crystal-grain size as the principal component, and a ceramic phase (with the proviso that carbon is excluded).

[3] A ceramic composite as set forth in claim 1 or 2, characterized in that the content of the phase having carbon as the principal component is 2 to 98 wt. %.

[4] A ceramic composite as set forth in any of claims 1 through 3, characterized in that the open porosity in the composite superficially after being polished is 1% or less.

[5] A ceramic composite as set forth in any of claims 1 through 4, characterized in that the Vickers hardness of the composite in sintered form is 10 GPa or greater.

[6] A ceramic composite as set forth in any of claims 1 through 5, characterized in that the ceramic phase is constituted from at least one selected from the group made up of nitrides, carbides, oxides, composite nitrides, composite carbides, composite oxides, carbonitrides, oxynitrides, oxycarbonitrides, and oxycarbides of Al, Si, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W.

[7] A method of manufacturing a ceramic composite as set forth in any of claims 1 or 3 through 6, composed of a phase having carbon of 3 μm or less average crystal-grain size as the principal component, and a ceramic phase, characterized in that a powder blend of a ceramic powder (with the proviso that carbon is excluded) in which the average crystal-grain size is 3 μm or less and a carbon powder is molded, and the obtained

molded form is sintered within a non-oxidizing atmosphere at a sintering temperature of 800 to 1500°C and a sintering pressure of 200 MPa or more.

[8] A method of manufacturing a ceramic composite as set forth in claim 7, composed of a phase having carbon of 3 μm or less average crystal-grain size as the principal component, and a ceramic phase, characterized in that the ceramic powder is at least one selected from the group made up of nitrides, carbides, oxides, composite nitrides, composite carbides, composite oxides, carbonitrides, oxynitrides, oxycarbonitrides, and oxycarbides of Al, Si, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W.

[9] A method of manufacturing a ceramic composite as set forth in claim 7 or 8, composed of a phase having carbon of 3 μm or less average crystal-grain size as the principal component, and a ceramic phase, characterized in that the powder blend further includes at least one metal selected from Al, Si, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W.

[10] A method of manufacturing a ceramic composite as set forth in any of claims 2 through 6, composed of a phase having carbon of 30 nm or less average crystal-grain size as the principal component, and a ceramic phase, characterized in that a powder blend of a ceramic powder (with the proviso that carbon is excluded) in which the average crystal-grain size is 30 nm or less and a carbon powder is molded, and the obtained molded form is sintered within a non-oxidizing atmosphere at a sintering temperature of 800 to 1500°C and a sintering pressure of 200 MPa or more.

[11] A method of manufacturing a ceramic composite as set forth in claim 10, composed of a phase having carbon of 30 nm or less average crystal-grain size as the principal component, and a ceramic phase, characterized in that the ceramic powder is one or more selected from the group made up of nitrides and carbides, as well as oxides, composite nitrides, composite carbides, composite oxides, carbonitrides, oxynitrides,

oxycarbonitrides, and oxycarbides of at least one metal selected from Al, Si, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W.

[12] A method of manufacturing a ceramic composite as set forth in claim 10 or 11, composed of a phase having carbon of 30 nm or less average crystal-grain size as the principal component, and a ceramic phase, characterized in that the powder blend further includes at least one metal selected from Al, Si, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W.